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Service & Repair Procedure:
690-692 Series Thermometer Service & Repair

DRAWN: Mary L Furlong	DATE: 2015-04-14
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VER	DESCRIPTION OF CHANGE	VER CREATED BY (initials)	DATE VER CREATED	CHANGE NUMBER /APVD
A	<p>Transfer from QSI into SRP template as an admin change/release. Replaces WI-17206283.</p> <p>Removed:</p> <ol style="list-style-type: none"> 1. Instruction to confirm item matches traveler per MPD WI-PS-0025, 0025 no longer has that requirement. 2. 9600 calibrator - no longer used, use the 9600 plus now. 3. WI-113-027 - obsolete - process followed now is in WI-PS-0025. 4. Removed reference to evaluation required per complaint purposes, complaint requirements are defined in WI-PS-0025. 5. WI-17206541 - obsolete replaced by 80018612. 6. Reference to "Data Entry" changed to "designated area" - process flows in service are changing. 7. Equipment record update of return label is no longer required. Removed corresponding photos. 8. Removed "Record on Traveler from title of Comment column in table. Benches are entering it directly into SAP. <p>Added:</p> <ol style="list-style-type: none"> 1. Reference to 20011296 for instructions to set-up the 9600 plus. 	MLF	2015-04-14	D*

D* SEE SAP DIR FOR CHANGE NUMBER, APPROVER NAME AND DATE OF APPROVAL

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1.0 Purpose:

- a. To provide the work instruction for the processing and calibration verification of the Model 690 and 692 Sure Temp Plus Thermometers received from the field.

2.0 Scope:

- a. This work instruction applies to the Welch Allyn Product Service Department, and specifically the Model 690/692 Thermometer field returns and evaluation devices.

3.0 Responsibilities:

- a. Service management shall ensure that the requirements of this document are communicated and implemented.
- b. It is the responsibility of the personnel who evaluate the SureTemp Plus thermometers to comply with the requirements of the work instruction.

4.0 Definitions:

- a. See **80018612** for a list of Service definitions.

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5.0 Associated Documents:

- a. **690/692**—M690/692 Series Therm Repair BOM
- b. **E-01690-200**—EVL,PKG,THERM,M690,4FT ORAL Eval BOM
- c. **E-01692-200**—E EVL,PKG THERM,M692,4FT ORAL Eval BOM
- d. **20011296**—SRP Spot LXi Series Screening & Final Test
- e. **70013008**—HOW2 Print In-House Labels from SAP
- f. **71221-0000**—MANUAL,TECHNICAL M690_692
- g. **80018612**—SERVICE BUSINESS DEFINITIONS
- h. **WI-113-005**—Evaluation & Testing of Oral-Rectal Probes
- i. **WI-17206421**—Instruction for printing 1" X 4" product packaging labels
- j. **WI-PS-0025**—Service Bench Data Capture Requirements

6.0 History of Product Changes:

- a. NA

7.0 Work Instruction Steps:

a. Safety Information:



- i. NA.

b. Environmental Requirements:



- i. Dispose of used batteries and scrapped parts properly into waste receptacles according to national or local regulations.

c. Special Handling Requirements:

- i. NA

d. Review Paperwork:

- i. Review all reason for return (allegation) information.
- ii. Check for any special instructions: rush, warranty, etc.

e. Equipment Set-up:

- i. See SAP DIR **20011296** for instructions to set-up the **9600 Plus** calibrators.

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f. Initial Screening:

i. Visually inspect for any obvious:

1. Physical damages either caused by mishandling or shipping damages.
2. Evidence of contamination or corrosion.
3. Evaluation units only:
 - a. Look over the exterior of the unit for the following:
 - i. Customer applied labels – remove them.
 - ii. **“For Evaluation Only”** label should be intact, replace as needed.
 - iii. Ink marks/dirt – clean off.
 - iv. Deep scratches, cracks or dings in the housings – scrap the unit.
 - v. Minor scratches on the housing (not the LCD window) are OK, if not sure, contact the lead technician

ii. Evaluation/Test:

1. The only acceptable repairs that can be performed are:
 - a. Battery replacement.
 - b. Probe well assembly replacement.
2. Test the product using Service test products as follows:
 - a. Thermometer will be verified using a test probe, 9600 Plus Calibration Tester and Calibration Key, if applicable.
3. Cal Key Test:
 - a. Plug in a calibration key and the unit should read **97.3 +/- 0.2** deg F.
4. Thermometer functional check:
 - a. **Plug the connector of a known good probe into the thermometer:**
 - i. Insert the probe well then insert the probe into probe well.
 - ii. Remove the probe and verify:
 1. That the unit initializes and all segments display.
 2. The thermometer should read:
 - a. **“ORAL”** for an oral probe.
 - b. **“RECTAL”** for a rectal probe.
 - b. **Using a known good probe and the 9600 plus calibrator on the low setting:**
 - i. Press the mode switch once to enter monitor mode.
 - ii. Wait about one minute for the reading to update.
 - iii. The updated reading should be:
 1. **9600 plus:** +/- 0.2 deg F of the set point on the calibrator.
 - iv. Re-insert the probe in the unit to clear the readings.
 - c. **Using a known good probe and calibrator on the high setting:**
 - i. Press the mode switch once to enter monitor mode.
 - ii. Wait about one minute for the reading to update.
 - iii. The updated reading should be:
 1. **9600 plus:** +/- 0.2 deg F of the set point on the calibrator.

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d. Check the biotech data:

- i. Enter the biotech mode - see service manual **71221-0000** as needed.
- ii. Record the following on the traveler:
 1. Software version:
 - a. Verify that the software version is **1.2** or higher.
 - b. If software is not **1.2** or higher, the unit cannot be returned to the customer.
 - c. Evaluation units must also have a software version of **1.2** or higher.
 2. Battery voltage:
 - a. Minimum acceptable voltage is **4.5 vdc**.
 - b. **Customer Units**: Replace the batteries as needed.
 - c. **Evaluation Units**: Replace the batteries regardless of test results.
 3. Temperature cycle count.
 4. Stored error codes:
 - a. If there are any codes that indicate a potential thermometer failure, the thermometer fails the test.
5. Probe functional check:
 - a. **Customer Units**: Check the probe per instructions in **MPD WI-113-005**.
 - b. **Evaluation Units**:
 - i. If there is an allegation associated with the evaluation unit:
 1. Check the probe per instructions in **MPD WI-113-005**.
 - ii. If there are no allegation(s):
 1. Used probe - Replace it.
 2. Unused probe, i.e. WA sealed packaging intact, no testing required.

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6. The following Error Codes can be used to assist you in verifying the problems.

Error Codes	Description
E0.1	Excessive Heater Energy
E0.2	A/D Measurement out of range error.
E0.4	Probe Over Temperature (110°F/43.3°C)
E0.5	No Probe Temperature Rise. (The heater has no effect.)
E0.6	Probe EEPROM read failure. (Bad EEPROM handshake.)
E0.7	Probe EEPROM is un-initialized.
E0.8	EEPROM CRC Failure (EEPROM is corrupted.)
E0.9	Bad probe calibration.
E4.0	PTB measurement out of range.
E4.1	RCAL measurement out of range.
E4.2	Reference power supply malfunction.
E4.3	Device EEPROM save failure.
E4.4	Device EEPROM starting handshake failure.
E4.5	Device EEPROM response failure.
E4.6	Transmit failure to the Device EEPROM.
E4.7	Can't initialize the device EEPROM
E4.8	Device was not calibrated
E5.0	Heater is not working properly.
E5.2	Heater fail-safe failure.
23	Host Interface Error
26	Invalid SureTemp mode
29	Battery Voltage Is Not Set
30	Prediction mode Is Not Set
71	Device EEPROM acquire failure
72	Device EEPROM release failure
73	Device EEPROM invalid pointer failure.
b^	Battery voltage too high.
Bv	Battery voltage too low.
A^!	Ambient temperature too high.
Av!	Ambient temperature too low.
	Patient Temperature out of range. < 80°F/26.7°C or > 110°F/43.4°C

iii. Evaluation Units only:

1. This section does not apply to customer units.
2. **If unit fails:**
 - a. Write up all findings as a scrap in house per normal process.
 - i. See **MPD WI-PS-0025** as needed.
 - b. Forward the order to designated location.
3. **If unit passed:**
 - a. The unit shall be returned to the evaluation pool.
 - b. Write up as no problem found.
 - i. See **MPD WI-PS-0025**.
 - c. Proceed to next section

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4. Package Evaluation Unit:

- a. Package the unit as shown in **Photos 7-16** in the attached file.
- b. Replace “**For Evaluation Only**” sticker on unit as needed.
- c. Examine the shipping container:
 - i. Replace any damaged boxes or inserts.
 - ii. Replace if missing or illegible:
 1. See **Photo 16** in the attached file.
 2. Serial number label.
 - a. **Note:** If box has the small **1/2 x 1 1/4** San Diego serial number label, remove or cover it with tape.
 - b. See **70013008** for instructions on printing a new **1 x 4** label.
 - c. **Note:** When printing a new serial number label, enter the lot code as follows; current year & month - format: **yymm**.
 3. For Evaluation Only sticker.
 4. Material number sticker.
 - a. **Note:** If box has the **2x4** San Diego material number label:
 - b. Remove or cover it with tape.
 - c. Obtain a New York **1x4** material number label.
 - d. See **MPD WI-17206421** as needed.
- d. Forward the order to designated area.

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g. Write Up Repairs:

i. Warranty Guidelines:

1. This section does not apply to **Evaluation Units**.
 2. See **MPD WI-PS-0025** for charge code guidelines.
 - a. **Notes:**
 - i. Because this is a flat rate item *if customer is to be charged for any portion of the repair*, then the charge code for all operations & components should be a dash or check mark for quoting purposes.
 - ii. "NC" or "WR" should not be used.
 3. Warranty period for the thermometers:
 - a. **Model M690:** 2 years.
 - b. **Model M692:** 3 years.
 4. Warranty period for the probe/probe well:
 - a. See **MPD WI-113-005**.
 5. Warranty is determined by date of purchase, if known.
 6. If date of purchase is unknown, warranty will be determined by date of manufacture.
 7. Prior repairs have a 90 day warranty.
 8. If unit shows obvious signs of abuse, it should be quoted regardless of warranty status.
 9. **Notes:**
 - a. Probe assemblies returned with the unit will be processed as a component of the unit.
 - b. Warranty on the probe is independent of the unit warranty & should be written up as warranty or quoted, etc. per normal guidelines.
 - i. See tables below for detailed text entry instructions.
 - c. See **MPD WI-PS-0025** as needed.
- ii. Replacement info:**
1. Replacement of defective units will be done on a Service Replacement order.
 - a. **If the unit is replaced**, the probe will also be replaced via a Service Replacement order.
 - b. **If the unit is not replaced**, the probe/well assembly will be replaced by the bench if defective.
- iii. Update the traveler with all findings per MPD WI-PS-0025.**
- iv. Review the paperwork to determine if a replacement was sent.**
1. If there is no repair order number listed, a replacement was sent, proceed as follows:
 - a. Record prominently on the traveler:
 - i. The date
 - ii. Your badge number
 - iii. The words: "**Scrap in house**".

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2. If a repair order is listed, it indicates no replacement was sent:

		Unit:	Probe:	Unit Test:	Probe Test:	Comments:
Table Notes Below:	1	NW	NW	Fail	Pass	Standard item comments for findings. "Override to thermometer only flat rate." Ext: "Charges are for thermometer replacement only." Hdr int: "Needs replacement order if quote approved."
Hdr int: =	2	NW	NW	Fail	Fail	Standard item comments for findings. Hdr int: "Needs replacement order if quote approved."
Header Internal Text entry.	3	NW	NW	Pass	Pass	Standard item comments for findings. Return As Is as no problem found.
	4	NW	NW	Pass	Fail Rpl probe	Standard item comments for findings. Ext: "Charges are for probe replacement only." "Override to probe only flat rate."
Ext = Item External Text entry.	5	NW	W	Fail	Fail	Standard item comments for findings. "Override to thermometer only flat rate." Ext: "Charges are for thermometer replacement only." Ext: "Probe replaced under warranty." Hdr int: "Needs replacement order if quote approved."
	6	NW	W	Fail	Pass	Standard item comments for findings. "Override to thermometer only flat rate." Ext: "Charges are for thermometer replacement only." Ext: "Probe replaced under warranty." Hdr int: "Needs replacement order if quote approved."
NW = Non-warranty	7	NW	W	Pass	Fail Rpl probe	Standard item comments for findings. Ext: "Probe replaced under warranty."
W = warranty	8	NW	W	Pass	Pass	Standard item comments for findings. Return As Is as no problem found.
	9	W	NW	Fail	Fail	Standard item comments for findings. "Override to probe only flat rate." Ext: "Thermometer replaced under warranty." Ext: "Charges are for probe replacement only." Hdr int: "Needs replacement order if quote approved."
	10	W	NW	Fail	Pass	Standard item comments for findings. "Needs replacement order - Warranty"
	11	W	NW	Pass	Fail Rpl probe	Standard item comments for findings. "Override to probe only flat rate." Ext: "Charges are for probe replacement only."
	12	W	NW	Pass	Pass	Standard item comments for findings. Return As Is as no problem found.
	13	W	W	Fail	Pass	Standard item comments for findings. "Needs replacement order - Warranty"
	14	W	W	Fail	Fail	Standard item comments for findings. "Needs replacement order - Warranty"
	15	W	W	Pass	Pass	Standard item comments for findings. Return As Is as no problem found.
	16	W	W	Pass	Fail Rpl probe	Standard item comments for findings.

3. Disposition order and parts per **MPD WI-PS-0025**.